ETM620 Series

AMD Geode™ LX Family
ETX v3.01 SoM
with Multiple I/O Features

User's Manual

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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Chapter 1
Introduction

The **ETM620** is a finest embedded ETX computer-on-module in the market, which makes a generic interface to connect the module to peripherals such as hard disk, mouse, and display. The innovative architecture and high level of integration of AMD Geode™ LX800/900 processors onboard can deliver low power and enable small form-factor designs for products. It makes the all-in-one single module together with excellent Multiple I/O, one CRT for DAC output, one LCD through ETX connector, Fast Ethernet and AC'97 Codec Audio interface. It also provides one 200-pin DDR 333/400 SODIMM with maximum up to 1GB system memory, one FDD/LPT port, PCI and ISA Bus for expansion purpose, two PATA, two SATA and four USB 2.0 ports supported.

Therefore, the **ETM620** module provides versatility to cater for various clients' applications; moreover, its flexible modularity goes with appropriately designed baseboard to make the best solution for customization, and last a durable lifetime to cope with fast evolving technology.

1.1 Specifications

- **CPU: AMD Geode™ LX800/900 processors**
- **System Chipset: CS5536AD**
- **BIOS**
  - Phoenix-Award BIOS, Y2K compliant
  - 4Mbit Flash, DMI, Plug and Play
  - SmartView for multiple LCD type selection, display mode option and application extension features
  - RPL/PXE Ethernet Boot ROM
  - "Load Optimized Default" to backup customized Setting in the BIOS flash chip to prevent from CMOS battery fail
- **System Memory**
  - One 200-Pin DDR 333/400 SODIMM socket
  - Maximum up to1GB system memory
- **Onboard IDE**
  - Two Parallel ATA-100
  - Two Serial ATA-150
- **CompactFlash Socket (Optional)**
  - CompactFlash™ Type-II Socket
- **Onboard Multi I/O**
  - One LPT port with SPP/ECP/EPP compliant
  - One Floppy port, shared with LPT
- **USB Interface**
  - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0
- **Watchdog Timer**
  - 0~255 seconds; up to 255 levels
- **Graphics:**
  - Integrate AMD LX
  - Max. up to 254MB frame buffer sharing system memory
  - Single display mode resolutions:
    - CRT: 1920 x 1440
    - LCD: 1600 x 1200
- **Ethernet**
  - Realtek RTL8139DL PCI Bus 10/100M Base-T

- Wake On LAN (via ATX power supply)

- **Audio:**
  - AC'97 Codec Audio
  - MIC-in, Line-in, Line-out
- **TV-OUT (Optional)**
  - NTSC 640*480 mode
  - PAL 640*480 mode
- **Power Management**
  - ACPI (Advanced Configuration and Power Interface)
- **Form Factor: ETX form factor 95 mm x 114 mm**

***NOTE**: All specifications and images are subject to change without notice.*

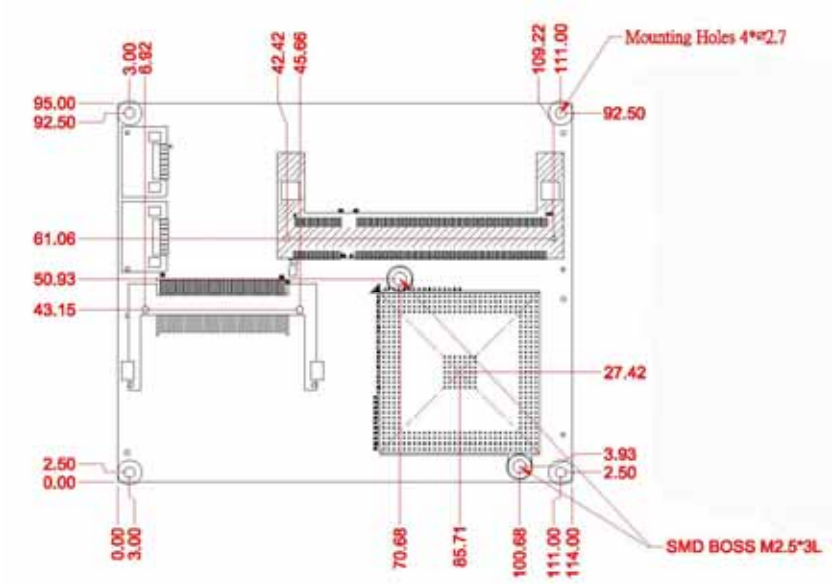
1.2 Utilities Supported

- Chipset Driver
- Ethernet Driver
- VGA Drivers
- Audio Drivers

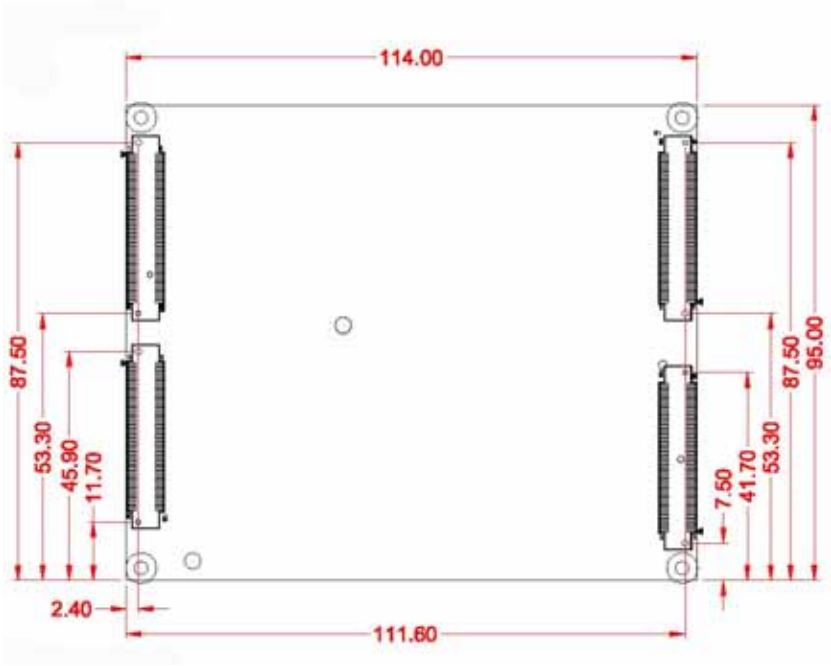
MEMO

Chapter 2
Board Layout and Connectors

2.1 Board Dimensions and Fixing Holes

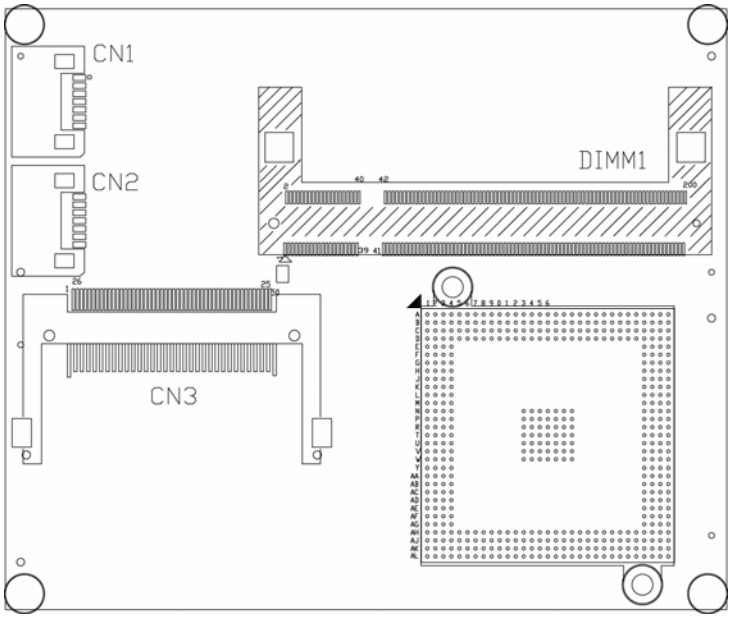


Component Side

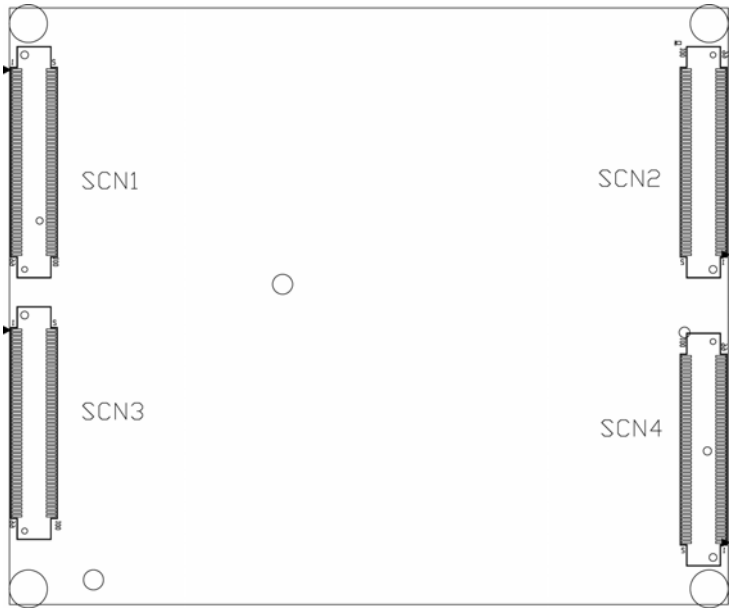


Solder Side

2.2 Board Layout



Component Side



Solder Side

2.3 Connectors

Make sure all connectors are properly and firmly connected. Here is a summary table shows you all connectors on the ETM620 Series.

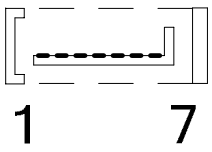
Connectors	Label
SATA Connector	CN1
SATA Connector	CN2
CompactFlash™ Connector	CN3
DDR Ⅱ SO-DIMM	DIMM1
ETX Connector – X1	SCN3
ETX Connector – X2	SCN1
ETX Connector – X3	SCN4
ETX Connector – X4	SCN2

2.3.1 7-pin SATA Connectors: CN1, CN2

These SATA connectors are for high-speed SATA interface ports and they can be connected to hard disk devices.

Pin	Description
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

CN1, CN2



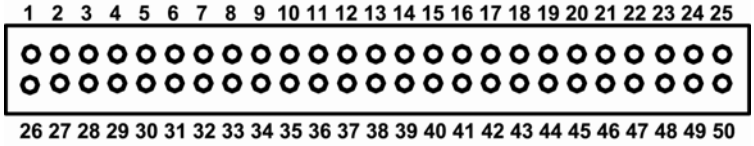
2.3.2 CompactFlash™ Connector: CN3

The board is optionally equipped with a CompactFlash™ disk type-II socket on the solder side to support an IDE interface CompactFlash™ disk card (*Note1). The socket is especially designed to avoid incorrect installation of the CompactFlash™ disk card. When installing or removing the CompactFlash™ disk card, please make sure the system power is off. The CompactFlash™ disk card is defaulted as the C: or D: disk drive in your PC system, selected by BIOS settting.

Pin	Description	Pin	Description
1	GND	26	CD1-
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	Address 10	33	VS1#
9	ATASEL	34	IORD#
10	Address 9	35	IOWR#
11	Address 8	36	WE#
12	Address 7	37	INTR
13	VCC	38	VCC
14	Address 6	39	CSEL#
15	Address 5	40	VS2#
16	Address 4	41	RESET#
17	Address 3	42	IORDY#
18	Address 2	43	DMAREQ
19	Address 1	44	DMAACK-
20	Address 0	45	DASP#
21	Data 0	46	PDIAG#
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	IOCS16#	49	Data 10

Pin	Description	Pin	Description
25	CD2#	50	GND

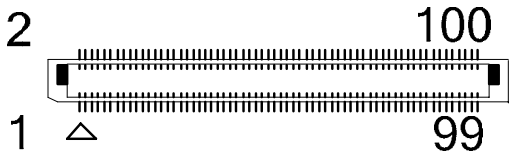
CN3



***Note1: The DMA mode is not supported.**

2.4 Pin Assignments

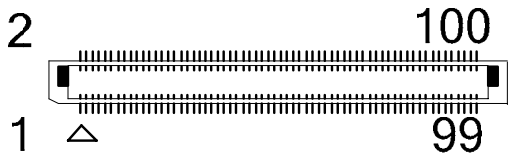
2.4.1 ETX Connector –X1: SCN3



Pin	Description	Pin	Description
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	PCI_REQ3#	10	PCI_GNT3#
11	PCI_GNT2#	12	VCC3
13	PCI_REQ2#	14	PCI_GNT1#
15	PCI_REQ1#	16	VCC3
17	PCI_GNT0#	18	N.C
19	VCC	20	VCC
21	SERIRQ	22	PCI_REQ0#
23	PCI_AD0	24	VCC3
25	PCI_AD1	26	PCI_AD2
27	PCI_AD4	28	PCI_AD3
29	PCI_AD6	30	PCI_AD5
31	PCI_C/BE0#	32	PCI_AD7

Pin	Description	Pin	Description
33	PCI_AD8	34	PCI_AD9
35	GND	36	GND
37	PCI_AD10	38	LINE_IN_L
39	PCI_AD11	40	MIC_IN
41	PCI_AD12	42	LINE_IN_R
43	PCI_AD13	44	ASVCC
45	PCI_AD14	46	LINE_OUT_L
47	PCI_AD15	48	ASGND
49	PCI_C/BE1#	50	LINE_OUT_R
51	VCC	52	VCC
53	PCI_PAR	54	PCI_SERR#
55	PCI_PERR#	56	N.C
57	PCI_PME#	58	USB2-
59	PCI_LOCK#	60	PCI_DEVSEL#
61	PCI_TRDY#	62	USB3-
63	PCI_IRDY#	64	PCI_STOP#
65	PCI_FRAME#	66	USB2+
67	GND	68	GND
69	PCI_AD16	70	PCI_C/BE2#
71	PCI_AD17	72	USB3+
73	PCI_AD19	74	PCI_AD18
75	PCI_AD20	76	USB0-
77	PCI_AD22	78	PCI_AD21
79	PCI_AD23	80	USB1-
81	PCI_AD24	82	PCI_C/BE3#
83	VCC	84	VCC
85	PCI_AD25	86	PCI_AD26
87	PCI_AD28	88	USB0+
89	PCI_AD27	90	PCI_AD29
91	PCI_AD30	92	USB1+
93	PCI_RST#	94	PCI_AD31
95	PCI_INTC#	96	PCI_INTD#
97	PCI_INTA#	98	PCI_INTB#
99	GND	100	GND

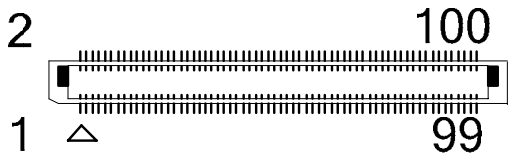
2.4.2 ETX Connector –X2: SCN1



Pin	Description	Pin	Description
1	GND	2	GND
3	ISA_SD14	4	ISA_SD15
5	ISA_SD13	6	MASTER#
7	ISA_SD12	8	DREQ7
9	ISA_SD11	10	DACK7#
11	ISA_SD10	12	DREQ6
13	ISA_SD9	14	DACK6#
15	ISA_SD8	16	DREQ5
17	ISA_MEMW#	18	DACK5#
19	ISA_MEMR#	20	DREQ0
21	ISA_LA17	22	DACK0#
23	ISA_LA18	24	IRQ14
25	ISA_LA19	26	IRQ15
27	ISA_LA20	28	IRQ12
29	ISA_LA21	30	IRQ11
31	ISA_LA22	32	IRQ10
33	ISA_LA23	34	IOCS16#
35	GND	36	GND
37	SBHE#	38	MEMCS16#
39	ISA_SA0	40	ISA_OSC
41	ISA_SA1	42	BALE
43	ISA_SA2	44	TC
45	ISA_SA3	46	DACK2#
47	ISA_SA4	48	IRQ3
49	ISA_SA5	50	IRQ4
51	VCC	52	VCC
53	ISA_SA6	54	IRQ5
55	ISA_SA7	56	IRQ6
57	ISA_SA8	58	IRQ7
59	ISA_SA9	60	SYSCLK

Pin	Description	Pin	Description
61	ISA_SA10	62	REFRESH#
63	ISA_SA11	64	DREQ1
65	ISA_SA12	66	DACK1#
67	GND	68	GND
69	ISA_SA13	70	DREQ3
71	ISA_SA14	72	DACK3#
73	ISA_SA15	74	IOR#
75	ISA_SA16	76	IOW#
77	ISA_SA18	78	ISA_SA17
79	ISA_SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	VCC	84	VCC
85	ISA_SD0	86	SMEMW#
87	ISA_SD2	88	ISA_SD1
89	ISA_SD3	90	N0WS#
91	DREQ2	92	ISA_SD4
93	ISA_SD5	94	IRQ9
95	ISA_SD6	96	ISA_SD7
97	IOCHK#	98	RSTDRV
99	GND	100	GND

2.4.3 ETX Connector –X3: SCN4



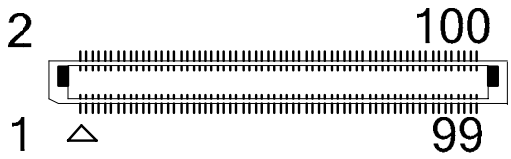
Pin	Description	Pin	Description
1	GND	2	GND
3	RED	4	BLUE
5	HSYNC	6	GREEN
7	VSYNC	8	DDCK
9	N.C /B1(*Note2)	10	DDDA
11	B6	12	LCD_CLK
13	B7	14	LDEMOD
15	GND	16	GND
17	B3	18	B5
19	B2	20	B4
21	GND	22	GND
23	G4	24	G7
25	G5	26	G6
27	GND	28	GND
29	R6	30	G3
31	R7	32	G2
33	GND	34	GND
35	R3	36	R5
37	R2	38	R4
39	VCC	40	VCC
41	N.C	42	N.C
43	N.C	44	BLON#
45	N.C	46	DIGON
47	COMP	48	Y
49	SYNC	50	C
51	N.C	52	N.C /G1(*Note2)
53	VCC	54	GND
55	STB#/I.C	56	AFD#/DENSEL
57	N.C /R1(*Note2)	58	PD7/N.C
59	IRRX	60	ERR#/HDSEL#

Pin	Description	Pin	Description
61	IRTX	62	PD6/N.C
63	RXD2	64	INIT#/DIR#
65	GND	66	GND
67	RTS2#	68	PD5/N.C
69	DTR2#	70	SLIN#/STEP#
71	DCD2#	72	PD4/DSKCHG#
73	DSR2#	74	PD3/RDATA#
75	CTS2#	76	PD2/WP#
77	TXD2#	78	PD1/TRK0#
79	RI2#	80	PD0/INDEX#
81	VCC	82	VCC
83	RXD1	84	ACK#/DRV
85	RTS1#	86	BUSY#/MOT
87	DTR1#	88	PE/WDATA#
89	DCD1#	90	SLCT#/WGATE#
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDAT
95	TXD1#	96	KBCLK
97	RI1#	98	KBDAT
99	GND	100	GND

***Note2: For 24bits TTL TFT LCD must connect to those pin.**

For 18bits TTL TFT LCD connect to MSB R7~2, G7~2, B7~2.

2.4.4 ETX Connector –X4: SCN2



Pin	Description	Pin	Description
1	GND	2	GND
3	5VSB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	RTC_BATTERY
9	N.C	10	N.C
11	RSMRST#	12	ACTLED
13	N.C /B0(*Note2)	14	SPEEDLED
15	N.C /R0(*Note2)	16	I2CLK
17	VCC	18	VCC
19	OVCR#	20	N.C
21	EXTSMI#	22	SMBDAT
23	SMBCLK	24	SMBDAT
25	N.C	26	SMBALRT#
27	N.C	28	DASP_S
29	N.C	30	PIDE_CS3#
31	N.C	32	PIDE_CS1#
33	GND	34	GND
35	N.C	36	PIDE_A2#
37	N.C	38	PIDE_A0#
39	N.C	40	PIDE_A1#
41	BATLOW#	42	N.C /G0(*Note2)
43	N.C	44	PIDE_INTRQ
45	N.C	46	PIDE_ACK#
47	N.C	48	PIDE_RDY
49	VCC	50	VCC
51	N.C	52	PIDE_IOR#
53	N.C	54	PIDE_IOW#
55	N.C	56	PIDE_DRQ
57	N.C	58	PIDE_D15
59	N.C	60	PIDE_D0

Pin	Description	Pin	Description
61	N.C	62	PIDE_D14
63	N.C	64	PIDE_D1
65	GND	66	GND
67	N.C	68	PIDE_D13
69	N.C	70	PIDE_D2
71	N.C	72	PIDE_D12
73	N.C	74	PIDE_D3
75	N.C	76	PIDE_D11
77	N.C	78	PIDE_D4
79	N.C	80	PIDE_D10
81	VCC	82	VCC
83	N.C	84	PIDE_D5
85	N.C	86	PIDE_D9
87	N.C	88	PIDE_D6
89	RING#	90	CBLID_P#
91	LAN_RX-	92	PIDE_D8
93	LAN_RX+	94	N.C
95	LAN_TX-	96	PIDE_D7
97	LAN_TX+	98	HDRST#
99	GND	100	GND

***Note2: For 24bits TTL TFT LCD must connect to those pin.**

For 18bits TTL TFT LCD connect to MSB R7~2, G7~2, B7~2.

Chapter 3
Hardware Description

3.1 Microprocessors

The **ETM620 Series** supports AMD Geode™ LX800/900 processors, which make your system operated under Windows XP and Linux environments. The system performance depends on the onboard microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

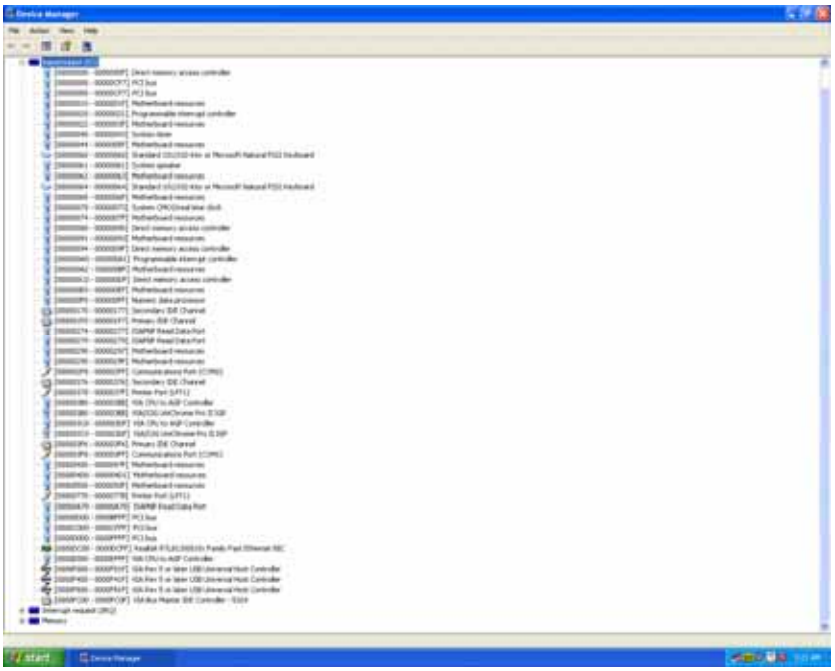
3.2 BIOS

System BIOS used on the **ETM620 Series** is Phoenix-Award Plug and Play BIOS. The **ETM620 Series** contains a single 4Mbit Flash.

3.3 System Memory

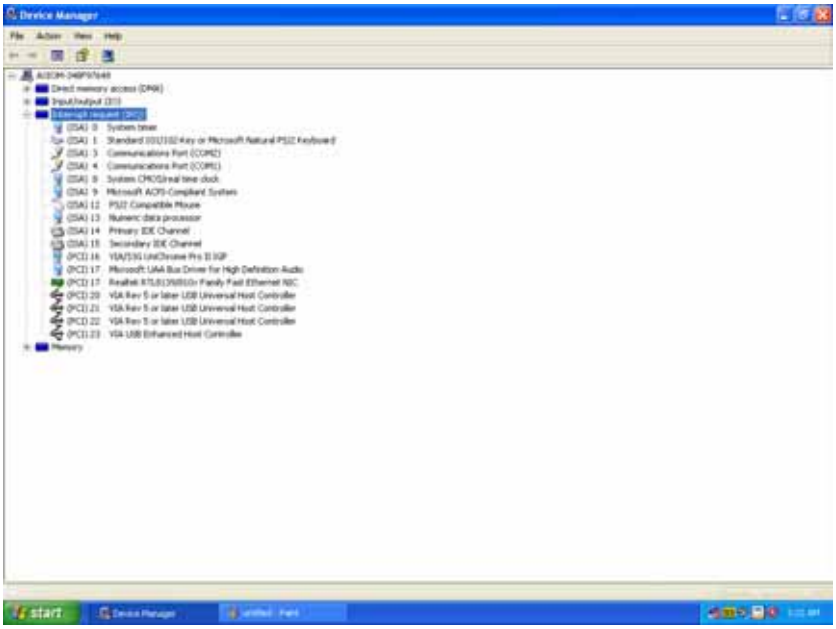
The **ETM620 Series** industrial CPU card supports one 200-pin DDR 333/400 SODIMM socket for a maximum memory of 1GB DDR SDRAMs. The memory module can come in sizes of 64MB, 128MB, 256MB, 512MB and 1GB.

3.4 Input/Output (I/O) Port Address Map (Under WinXP)



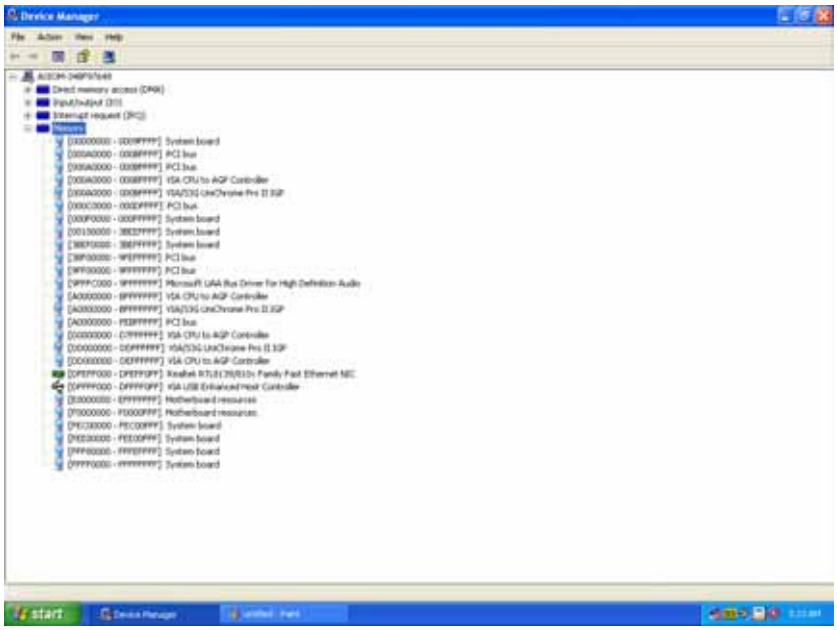
-- Input/Output (I/O) Map under XP OS --

3.5 Interrupt Request (IRQ) Map (Under WinXP)



-- Interrupt Request (IRQ) Map under XP OS --

3.6 Memory Map (Under WinXP)



-- Memory Map under XP OS --

Chapter 4
Award BIOS Utility

The Phoenix-Award BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a battery-backed-up RAM (CMOS RAM) to save the Setup information whenever the power is turned off.

4.1 Entering Setup

There are two ways to enter the Setup program. You may either turn ON the computer and press <Del> immediately, or press the <Del> and/or <Ctrl>, <Alt>, and <Esc> keys simultaneously when the following message appears at the bottom of the screen during POST (Power on Self Test).

TO ENTER SETUP PRESS DEL KEY

If the message disappears before you respond and you still want to enter Setup, please restart the system to try it again. Turning the system power OFF and ON, pressing the "RESET" button on the system case or simultaneously pressing <Ctrl>, <Alt>, and <Del> keys can restart the system. If you do not press keys at the right time and the system doesn't boot, an error message will pop out to prompt you the following information:

PRESS <F1> TO CONTINUE, <CTRL-ALT-ESC> OR <DEL> TO ENTER SETUP

4.2 Control Keys

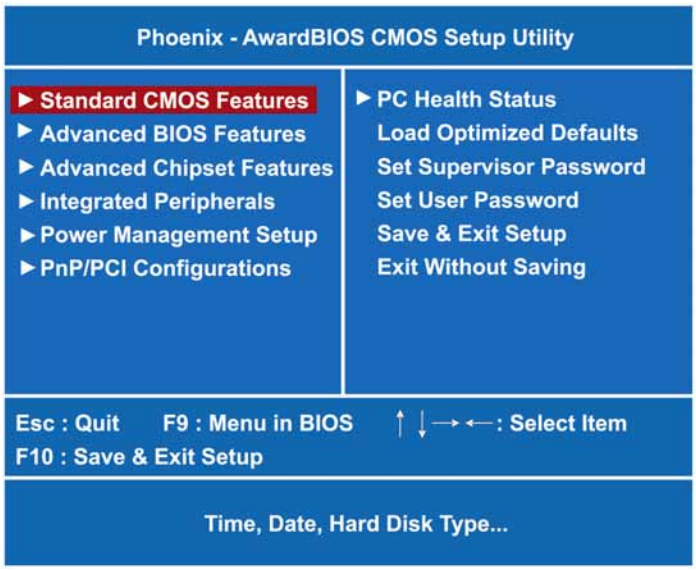
Up arrow	Move cursor to the previous item
Down arrow	Move cursor to the next item
Left arrow	Move cursor to the item on the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and delete changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp/"+" key	Increase the numeric value or make changes
PgDn/"–" key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
(Shift) F2 key	Change color from total 16 colors. F2 to select color forward, (Shift) F2 to select color backward
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the Setup default, only for Option Page Setup Menu
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3 Getting Help

- **Main Menu**
  The online description of the highlighted setup function is displayed at the bottom of the screen.
- **Status Page Setup Menu/Option Page Setup Menu**
  Press <F1> to pop out a small Help window that provides the description of using appropriate keys and possible selections for highlighted items. Press <F1> or <Esc> to exit the Help Window.

4.4 The Main Menu

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use arrow keys to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.

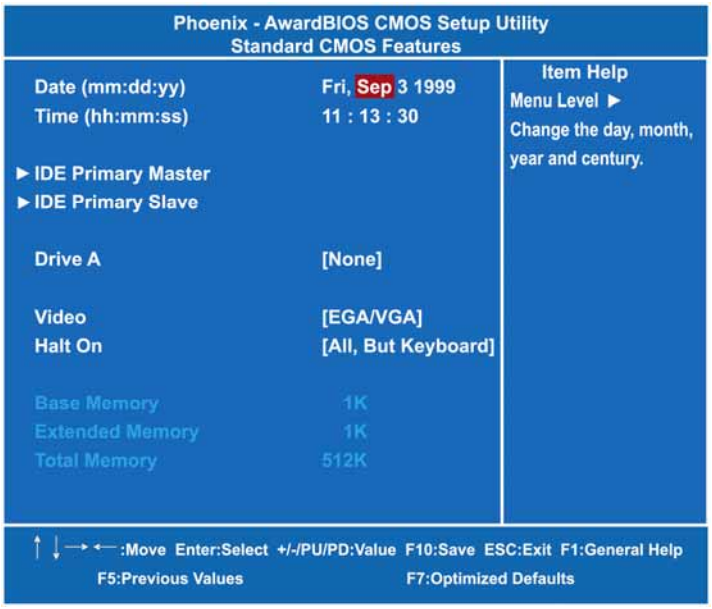

Phoenix - AwardBIOS CMOS Setup Utility
► Standard CMOS Features
► Advanced BIOS Features
► Advanced Chipset Features
► Integrated Peripherals
► Power Management Setup
► PnP/PCI Configurations
► PC Health Status
Load Optimized Defaults
Set Supervisor Password
Set User Password
Save & Exit Setup
Exit Without Saving
Esc : Quit F9 : Menu in BIOS ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup
Time, Date, Hard Disk Type...

NOTE: *If your computer can not boot after making and saving system changes with Setup, the Award BIOS will reset your system to the CMOS default settings via its built-in override feature.*

It is strongly recommended that you should avoid changing the chipset's defaults. Both Award and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.5 Standard CMOS Setup Menu

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Fri, Sep 3 1999
Time (hh:mm:ss) 11 : 13 : 30
► IDE Primary Master
► IDE Primary Slave
Drive A [None]
Video [EGA/VGA]
Halt On [All, But Keyboard]
Base Memory 1K
Extended Memory 1K
Total Memory 512K
Item Help
Menu Level ►
Change the day, month, year and century.
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **Date**

day	It is determined by the BIOS and read only, from Sunday to Saturday.
date	It can be keyed with the numerical/ function key, from 1 to 31.
month	It is from January to December.
year	It shows the current year of BIOS.

- **Time**
  This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.
- **IDE Primary Master/Primary Slave**
  These items identify the types of each IDE channel installed in the

computer. There are 45 predefined types (Type 1 to Type 45) and 2 user's definable types (Type User) for Enhanced IDE BIOS. Press <PgUp>/<+> or <PgDn>/<–> to select a numbered hard disk type, or directly type the number and press <Enter>. Please be noted your drive's specifications must match the drive table. The hard disk will not work properly if you enter improper information. If your hard disk drive type does not match or is not listed, you can use Type User to manually define your own drive type.

If selecting Type User, you will be asked to enter related information in the following items. Directly key in the information and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the HDD interface controller supports ESDI, select "Type 1".
If the HDD interface controller supports SCSI, select "None".
If the HDD interface controller supports CD-ROM, select "None".

CYLS.	number of cylinders	**LANDZONE**	landing zone
HEADS	number of heads	**SECTORS**	number of sectors
PRECOMP	write precom	**MODE**	HDD access mode

If there is no hard disk drive installed, select NONE and press <Enter>.

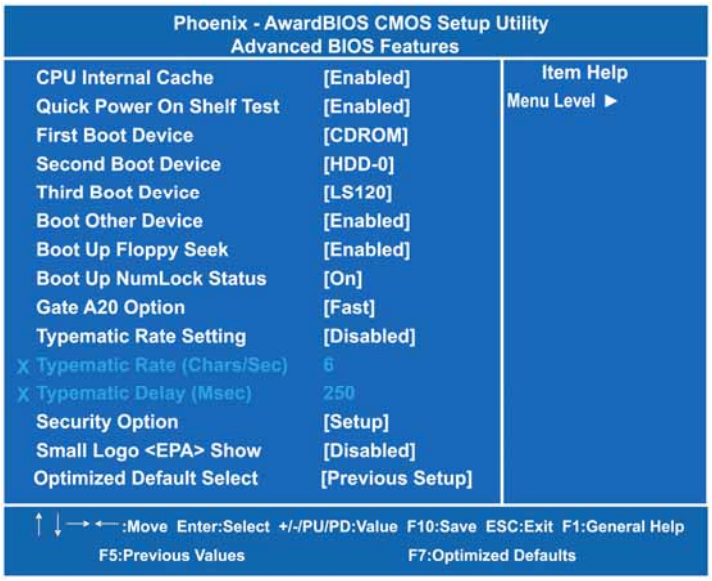
- **Video**
  Select the display adapter type for your system.
- **Halt On**
  This item determines whether the system will halt or not, if an error is detected while powering up.

No errors	The system booting will halt on any errors detected. (default)
All errors	Whenever BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system booting will not stop for a keyboard error; it will stop for other errors.
All, But Diskette	The system booting will not stop for a disk error; it will stop for other errors.
All, But Disk/Key	The system booting will not stop for a keyboard or disk error; it will stop for other errors.

Press <Esc> to return to the Main Menu page.

4.6 Advanced BIOS Features

This section allows you to configure and improve your system, to set up some system features according to your preference.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
CPU Internal Cache [Enabled]
Quick Power On Shelf Test [Enabled]
First Boot Device [CDROM]
Second Boot Device [HDD-0]
Third Boot Device [LS120]
Boot Other Device [Enabled]
Boot Up Floppy Seek [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
X Typematic Rate (Chars/Sec) 6
X Typematic Delay (Msec) 250
Security Option [Setup]
Small Logo <EPA> Show [Disabled]
Optimized Default Select [Previous Setup]
Item Help
Menu Level ►
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **CPU Internal Cache**
  Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs, from 486-type and up, contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory for even faster access by the CPU. These items are used to enable (speed up memory access) or disable the cache function. By default, these are *"Enabled*".
- **Quick Power On Self Test**
  This option speeds up Power on Self Test (POST) after you turn on the system power. If set as Enabled, BIOS will shorten or skip some check items during POST. The default setting is *"Enabled"*.

Enabled	Enable Quick POST
Disabled	Normal POST

- **First/Second/Third Boot Device**
  These items let you select the 1st, 2nd, and 3rd devices that the system will search for during its boot-up sequence. The wide range of selection includes Floppy, LS120, ZIP100, HDD0~3, SCSI, and CDROM.
- **Boot Other Device**
  This item allows users to enable or disable the boot device not listed in the First/Second/Third boot devices option above. The default setting is "*Enabled"*.
- **Boot Up Floppy Seek**
  During POST, BIOS will determine the floppy disk drive type, 40 or 80 tracks. The 360Kb type is 40 tracks while 720Kb, 1.2MB and 1.44MB are all 80 tracks. The default value is *"Enabled"*.

Enabled	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Please be noted BIOS can not differentiate 720K, 1.2M or 1.44M drive type as they all are 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message displayed if the installed drive is 360K.

- **Boot Up NumLock Status**
  Set the the Num Lock status when the system is powered on. The default value is *"On"*.
- **Gate A20 Option**
  The default value is *"Fast"*.

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast	Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Typematic Rate (Chars/Sec)**
  This option refers to character numbers typed per second by the keyboard. The default value is *"6"*.

6	6 characters per second
8	8 characters per second
10	10 characters per second
12	12 characters per second
15	15 characters per second
20	20 characters per second

24	24 characters per second
30	30 characters per second

- **Typematic Delay (Msec)**
  This option defines how many milliseconds must elapse before a held-down key begins generating repeat characters. The default value is *"250"*.

250	250 msec
500	500 msec
750	750 msec
1000	1000 msec

- **Security Option**
  This item allows you to limit access to the system and Setup, or just to Setup. The default value is *"Setup"*.

System	If a wrong password is entered at the prompt, the system will not boot, the access to Setup will be denied, either.
Setup	If a wrong password is entered at the prompt, the system will boot, but the access to Setup will be denied.

NOTE: *To disable the security, select PASSWORD SETTING at Main Menu and then you will be asked to enter a password. Do not type anything, just press <Enter> and it will disable the security. Once the security is disabled, the system will boot and you can enter Setup freely.*

- **Small Logo(EPA) Show**
  If enabled, the EPA logo will appear during system booting up; if disabled, the EPA logo will not appear.

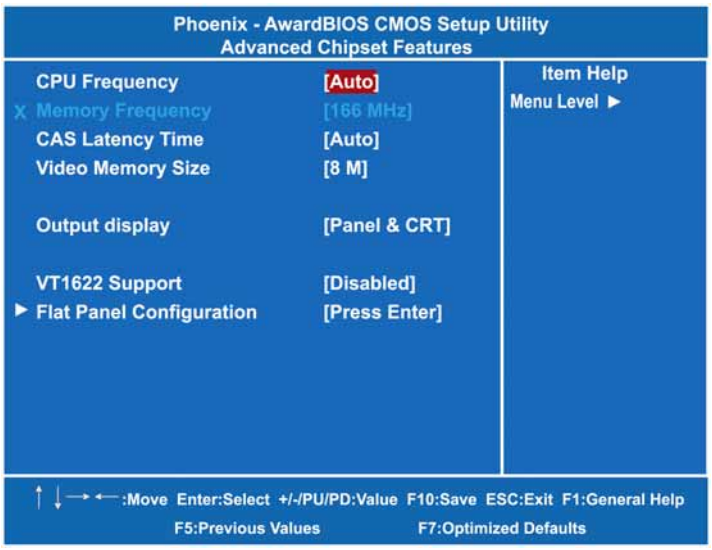
- **Optimized Default Select**
  This item allows you to select which Default Value you want to load. The default value is *"Previous Setup"*.

BIOS Optimized	This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.
Previous Setup	This option allows you to load your system configuration with Previous Setup value.

Press <Esc> to return to the Main Menu page.

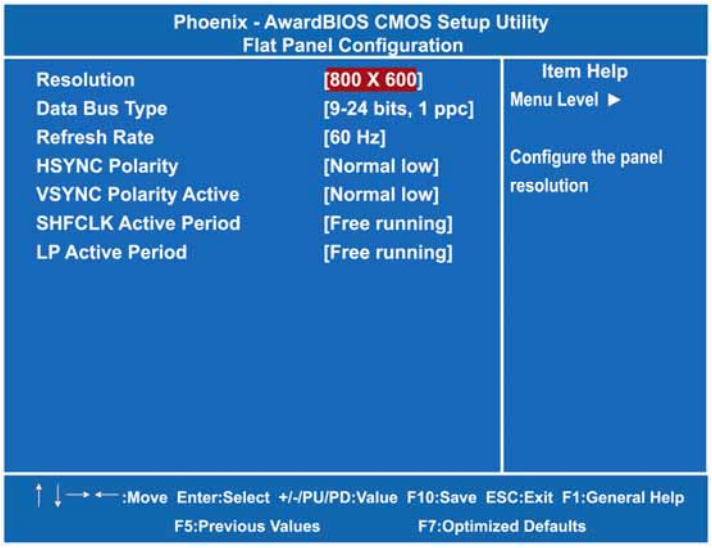
4.7 Advanced Chipset Features

This section contains completely optimized chipset's features on the board that you are strongly recommended to leave all items on this page at their default values unless you are very familiar with the technical specifications of your system hardware.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
CPU Frequency [Auto]
X Memory Frequency [166 MHz]
CAS Latency Time [Auto]
Video Memory Size [8 M]
Output display [Panel & CRT]
VT1622 Support [Disabled]
Flat Panel Configuration [Press Enter]
Item Help
Menu Level ►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **CAS Latency Time**
  You can select CAS latency time to HCLKs 2, 3, or Auto. The board designer should have set up these values in accordance with the installed DRAM. Do not change these values unless you have to change the specifications of the installed DRAM or CPU.
- **Video Memory Size**
  This item controls the amount of the system memory allocated to the integrated graphics processor when the system boots up.
- **Output Display**
  Use this item to select output display from these options: *"Panel & CRT", "Flat Panel"* and *"CRT"*.
- **VT1622 Support**
  This item controls the TV-OUT function to select output display mode.

- **Flat Panel Configuration**
  Scroll to this item and press <Enter> to view the Flat Panel Configuration sub menu.

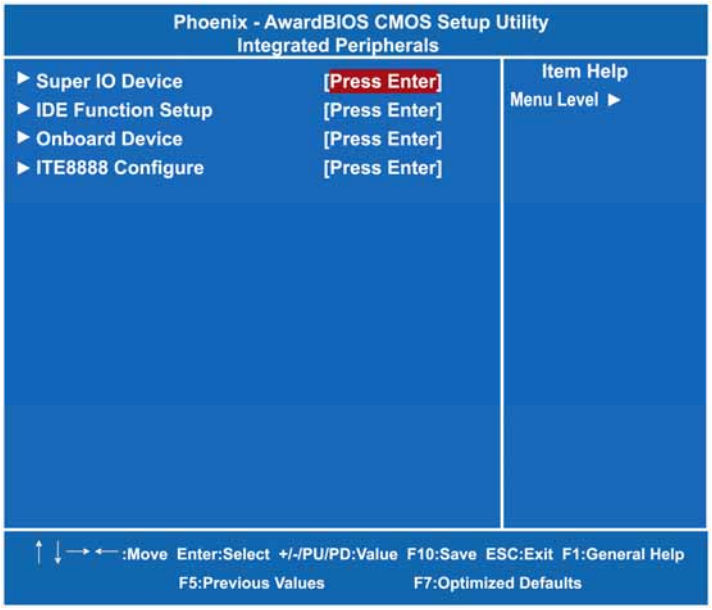

Phoenix - AwardBIOS CMOS Setup Utility
Flat Panel Configuration
Resolution [800 X 600]
Data Bus Type [9-24 bits, 1 ppc]
Refresh Rate [60 Hz]
HSYNC Polarity [Normal low]
VSYNC Polarity Active [Normal low]
SHFCLK Active Period [Free running]
LP Active Period [Free running]
Item Help
Menu Level ►
Configure the panel resolution
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

  - **Resolution**
    Use this item to configure the panel resolution.
  - **Data Bus Type**
    This item is to select data bus width and data type.

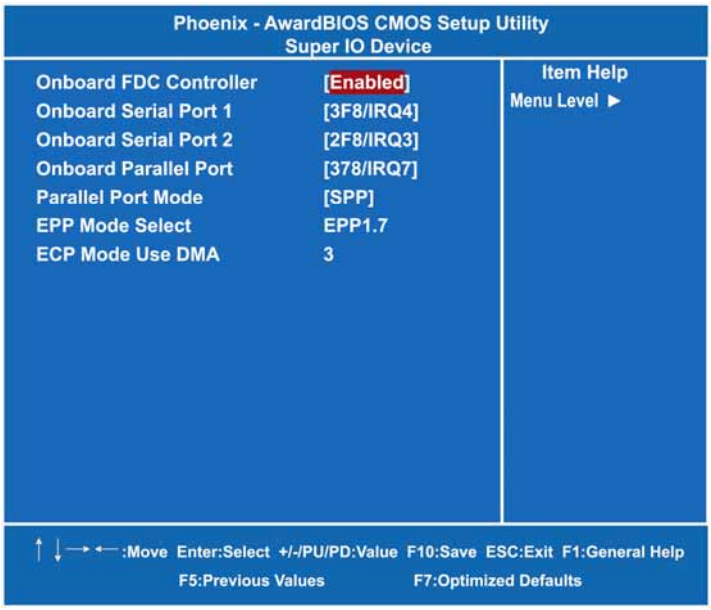
Press <Esc> to return to the Advanced Chipset Features page, and press it againg to the Main Menu.

4.8 Integrated Peripherals

This section allows you to configure your SuperIO Device, IDE Function and Onboard Device.


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
Super IO Device [Press Enter]
IDE Function Setup [Press Enter]
Onboard Device [Press Enter]
ITE8888 Configure [Press Enter]
Item Help
Menu Level ►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **Super I/O Device**
  Scroll to this item and press <Enter> to view the VIA OnChip IDE Device sub menu.

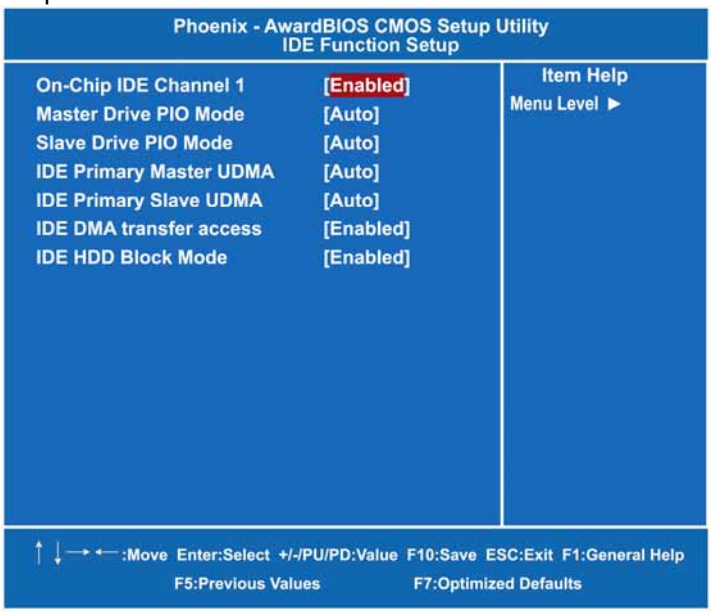

Phoenix - AwardBIOS CMOS Setup Utility
Super IO Device
Onboard FDC Controller [Enabled]
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
Onboard Parallel Port [378/IRQ7]
Parallel Port Mode [SPP]
EPP Mode Select EPP1.7
ECP Mode Use DMA 3
Item Help
Menu Level ►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

  - **Onboard FDC Controller**
    Select Enabled, if your system has a floppy disk controller (FDC) installed on the system board and you want to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field. Options are: *"Enabled"* and "*Disabled*".
  - **Onboard Serial Port 1/2**
    Select an address and corresponding interrupt for the serial port. Options are: *"3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3",* and *"Disabled*".
  - **Onboard Paralellel Port**
    This item allows you to determine the I/O address for onboard parallel port. Options are: *"378/IRQ7", "3BC/IRQ7"* and *"Disabled*".
  - **Parallel Port Mode**
    Select an operating mode for the onboard parallel (printer) port. Select Normal unless your hardware and software require another mode in this field. Options are: *"EPP1.9", "ECP", "SPP", "ECPEPP1.7"* and *"EPP1.7"*.

- **EPP Mode Select**
  Select EPP port type 1.7 or 1.9.
- **ECP Mode Use DMA**
  Select a DMA channel for the parallel port while using the ECP mode.

Press <Esc> to return to the Integrated Peripherals page.

- **IDE Function Setup**
  Scroll to this item and press <Enter> to view the IDE Function Setup sub menu.

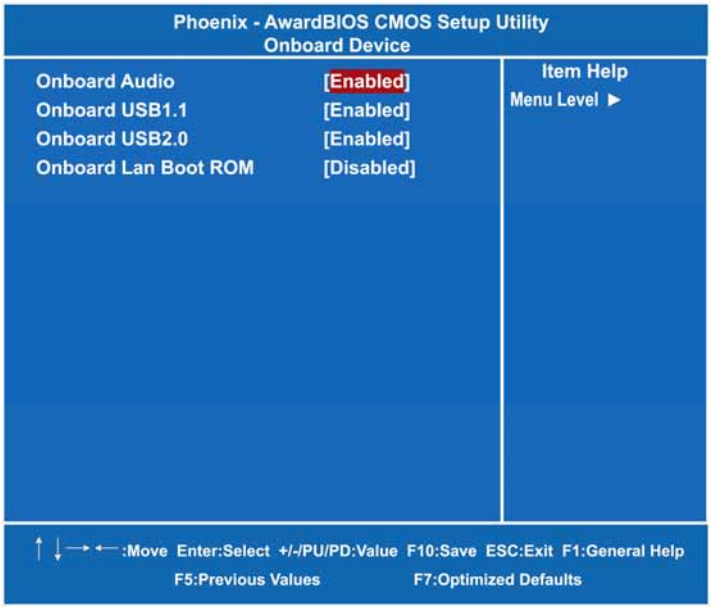

Phoenix - AwardBIOS CMOS Setup Utility
IDE Function Setup
On-Chip IDE Channel 1 [Enabled]
Master Drive PIO Mode [Auto]
Slave Drive PIO Mode [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
IDE DMA transfer access [Enabled]
IDE HDD Block Mode [Enabled]
Item Help
Menu Level ►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **OnChip IDE Channel 1**
  The board supports two channel of ordinary IDE interface. Select "Enabled" to activate each channel separately.
- **Master/Slave Drive PIO Mode**
  These IDE PIO (Programmed Input/Output) fields let you set a PIO mode for each of IDE devices that the onboard IDE interface supports. These modes provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

- **IDE Primary Master/Slave UDMA**
  Select the mode of operation for the IDE drive. Ultra DMA-33/66/100/133 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and system software both support Ultra DMA-33/66/100/133, select Auto to enable UDMA mode by BIOS.
- **IDE HDD Block Mode**
  Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

Press <Esc> to return to the Integrated Peripherals page.

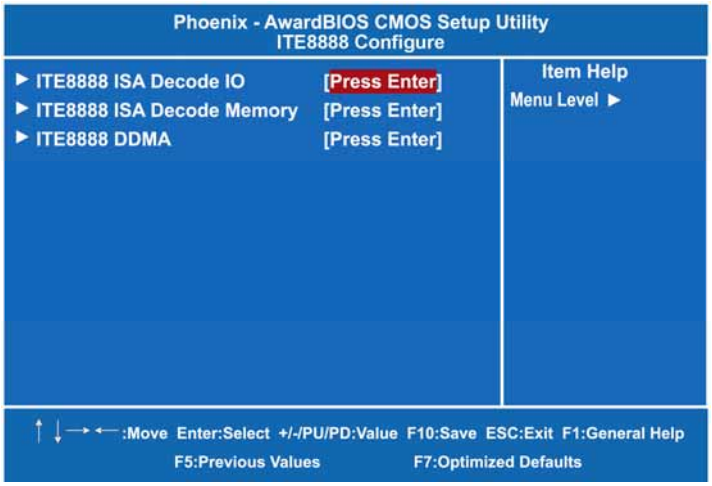
- **Onboard Device**
  Scroll to this item and press <Enter> to view the Onboard Device sub menu.



  - **Onboard Audio**
    Use this item to enable or disable the onboard Audio function.
  - **Onboard USB1.1**
    Enable this item if you are using USB1.1 in the system.
  - **Onboard USB2.0**
    Enable this item if you are using USB2.0 in the system.
  - **Onboard Lan Boot ROM**
    Use this item to enable or disable the Boot ROM function of the onboard LAN chip when the system boots up.

Press <Esc> to return to the Integrated Peripherals page.

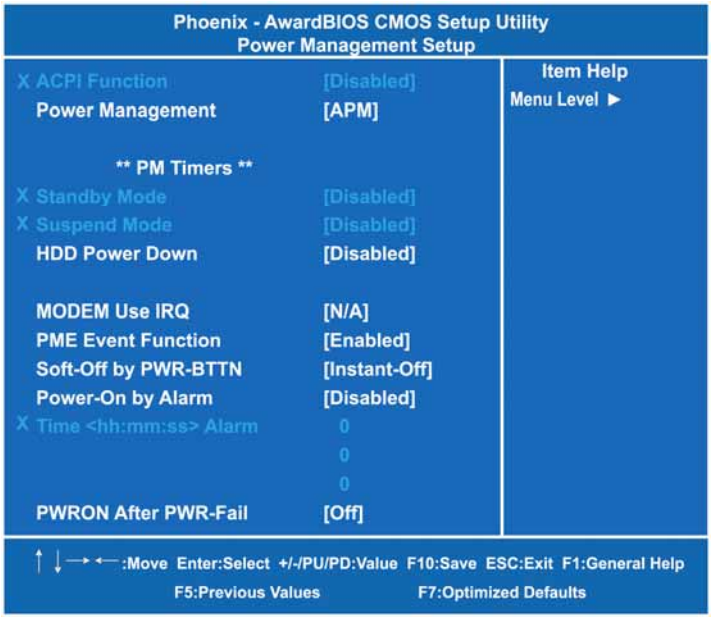
- **ITE8888 Configure**
  Scroll to this item and press <Enter> to view the ITE8888 Configure sub menu.


Phoenix - AwardBIOS CMOS Setup Utility
ITE8888 Configure
ITE8888 ISA Decode IO [Press Enter]
ITE8888 ISA Decode Memory [Press Enter]
ITE8888 DDMA [Press Enter]
Item Help
Menu Level ►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

Press <Esc> to return to the Integrated Peripherals page, and press it again to the Main Menu.

4.9 Power Management Setup

The Power Management Setup allows you to save energy of your system effectively. It will shut down the hard disk and turn OFF video display after a period of inactivity.



- **ACPI Function**
  This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI). The function is always "*Enabled*".
- **Power Management**
  This option allows you to select the type of power Management. Options are: *"APM"*, *"ACPI"*.
- **Standby Mode**
  After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.
- **Suspend Mode**
  After a selected period of system inactivity (1 minute to 1 hour), all devices except the CPU shut off. The default value is *"Disabled"*.

Disabled	The System will never enter the SUSPEND mode.
1/2/4/6/8/10 /20/30/40 Min/1 Hr	It defines continuous idle time before the system entering the SUSPEND mode. If any item defined in (J) is enabled and active, the SUSPEND timer will be reloaded.

- **HDD Power Down**
  If HDD activity is not detected for a specified length of time in this field, the hard disk drive will be powered down while other devices remain active.
- **Moden Use IRQ**
  If you want an incoming call on a modem to automatically resume the system from a powersaving mode, use this item to specify the interrupt request line (IRQ) used by the modem. You might have to connect the fax/modem to the board Wake On Modem connector for working this feature.
- **Soft-Off by PWR-BTTN**
  This option only works with systems using an ATX power supply. It also allows users to define which type of soft power OFF sequence the system will follow. The default value is *"Instant-Off"*.

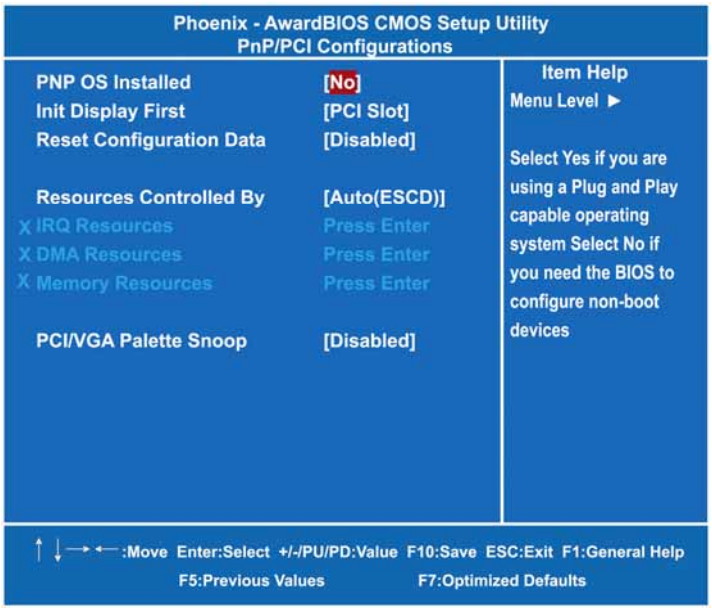
Instant-Off	This option follows the conventional manner of system performance when turning the power to OFF. Instant-Off is a software power OFF sequence requiring the power supply button is switched to OFF.
Delay 4 Sec.	Upon the system's turning OFF through the power switch, this option will delay the complete system power OFF sequence approximately 4 seconds. Within this delay period, the system will temporarily enter into the Suspend Mode enabling you to restart the system at once.

- **Power-On by Alarm**
  If enable this item, the system can automatically be powered on after a fixed time in accordance with the system's RTC (realtime clock).
- **PWRON After PWR-Fail**
  This item enables your computer to automatically restart or return to its operating status.

Press <Esc> to return to the Power Management page, and press it again to the Main Menu.

4.10 PnP/PCI Configuration Setup

This section describes the configuration of PCI (Personal Computer Interconnect) bus system, which allows I/O devices to operate at speeds close to the CPU speed while communicating with other important components. This section covers very technical items that only experienced users could change default settings.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
PNP OS Installed [No]
Init Display First [PCI Slot]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
X IRQ Resources Press Enter
X DMA Resources Press Enter
X Memory Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
Item Help
Menu Level ►
Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Optimized Defaults

- **PNP OS Installed**
  Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95). The default value is *"No"*.
- **Init Display First**
  This item allows you to decide whether PCI Slot or AGP to be the first primary display card.
- **Reset Configuration Data**
  Normally, you leave this item Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup or if installing a new add-on cause the system reconfiguration a serious conflict that the operating system can not boot. Options are: *"Enabled"*, *"Disabled"*.

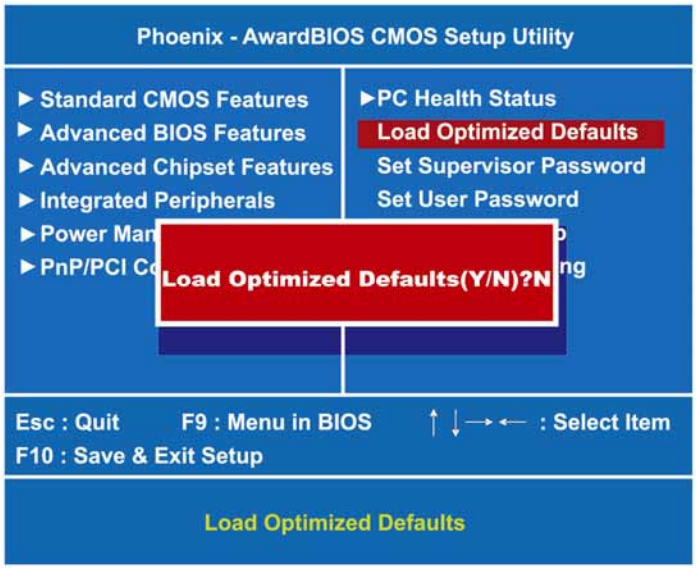
- **Resources Controlled By**
  The Award Plug and Play BIOS can automatically configure all boot and Plug and Play-compatible devices. If you select Auto, all interrupt request (IRQ), DMA assignment, and Used DMA fields disappear, as the BIOS automatically assigns them. The default value is *"Manual"*.
- **IRQ Resources**
  When resources are controlled manually, assign each system interrupt to one of the following types in accordance with the type of devices using the interrupt:
  1. Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
  2. PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

  The default value is *"PCI/ISA PnP"*.
- **DMA Resources**
  When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:
  Legcy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.
  PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.
  The default value is *"PCI/ISA PnP"*.
- **PCI/VGA Palette Snoop**
  Some non-standard VGA display cards may not show colors properly. This item allows you to set whether MPEG ISA/VESA VGA Cards can work with PCI/VGA or not. When enabled, a PCI/VGA can work with a MPEG ISA/VESA VGA card; when disabled, a PCI/VGA cannot work with a MPEG ISA/VESA Card.

Press <Esc> to return to the Main Menu page.

4.11 Load Optimized Defaults

This option allows you to load your system configuration with default values. These default settings are optimized to enable high performance features.



To load CMOS SRAM with SETUP default values, please enter "Y". If not, please enter "N".

4.12 Set Supervisor/User Password

You can set a supervisor or user password, or both of them. The differences between them are:

1. **Supervisor password:** You can enter and change the options on the setup menu.
2. **User password:** You can just enter, but have no right to change the options on the setup menu.

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type a maximum eight-character password, and press <Enter>. This typed password will clear previously entered password from the CMOS memory. You will be asked to confirm this password. Type this password again and press <Enter>. You may also press <Esc> to abort this selection and not enter a password.

To disable the password, just press <Enter> when you are prompted to enter a password. A message will confirm the password is getting disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

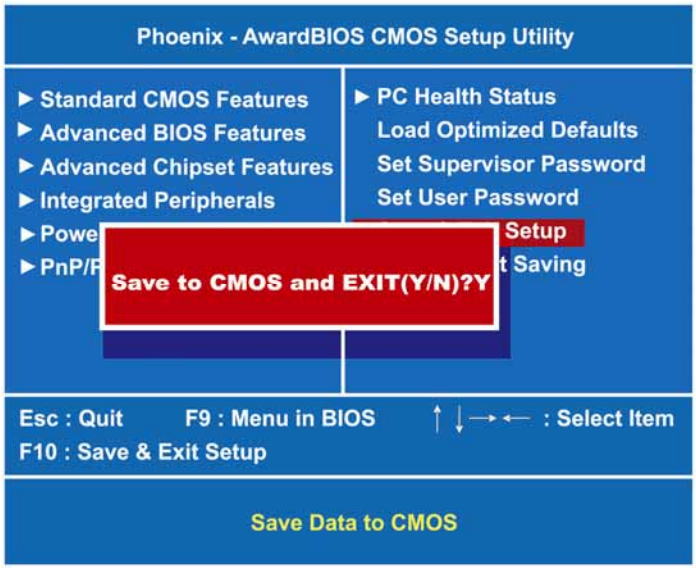
When a password is enabled, you have to type it every time you enter the Setup. It prevents any unauthorized persons from changing your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time the system reboots. This would prevent unauthorized use of your computer.

You decide when the password is required for the BIOS Features Setup Menu and its Security option. If the Security option is set to "System", the password is required during booting up and entry into the Setup; if it is set as "Setup", a prompt will only appear before entering the Setup.

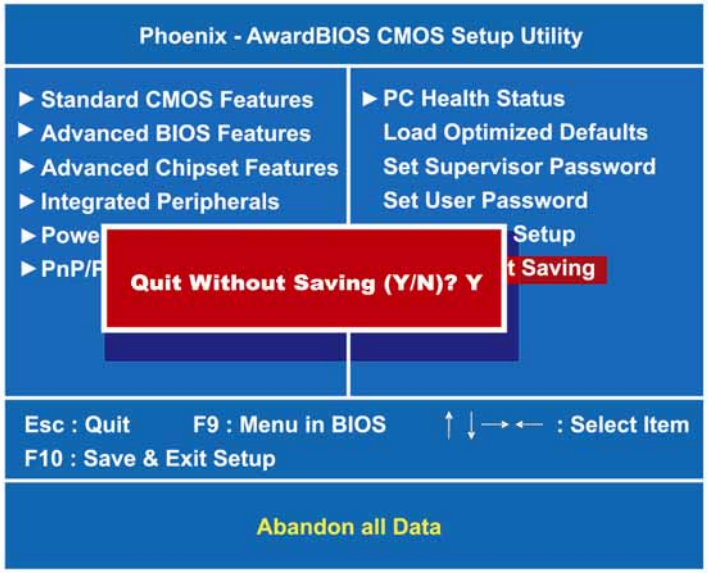
4.13 Save & Exit Setup

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes into the CMOS memory. Type "N" to bring you back to the Setup utility.



4.14 Exit Without Saving

Select this option to exit the Setup utility without saving changes you have made in this session. Type "Y", and it will quit the Setup utility without saving your modifications. Type "N" to return to the Setup utility.



A p p e n d i x
Watchdog Timer

Watchdog Timer Setting

The watchdog timer makes the system auto-reset while it stops working for a period. The integrated watchdog timer can be set up as system reset mode by program.

Timeout Value Range
1 to 255
Second

Program Sample
Watchdog timer sets up as system reset with 5 second of timeout.

2E, 87	
2E, 87	
2E, 07	
2F, 00	Logical Device 0
2E, 2B	Set WDT Funtion Enable
2F, 00	
2E, 07	
2F, 08	Logical Device 8
2E, 30	Activate
2F, 01	
2E, F3	Set Second
2F, N	N = 0 or 4
2E, F4	Set Value
2F, M	M = 00 ~ FF

Using the Watchdog Function

Start
↓
Un-Lock WDT: **O 2E 87 ; Un-lock super I/O**
O 2E 87 ; Un-lock super I/O
↓
Select Logic device:
O 2E 07
O 2F 00
Set WDT Funtion:
O 2E 2B
O 2F 00
Select Logic device:
O 2E 07
O 2F 08
↓
Activate WDT: **O 2E 30**
O 2F 01
↓ Set Second or Minute:
O 2E F3
O 2F N **N=00 or 04(See below table)**
↓
Set base timer: **O 2E F4**
O 2F M=00,01,02,…FF(Hex) ,Value=0 to 255
↓
WDT counting
↓
re-set timer: **O 2E F4**
O 2F M ; M=00,01,02,…FF(See below table)
↓
IF No re-set timer **:WDT time-out, generate RESET**

IF to disable WDT **:O 2E 30**
O 2F 00 ; Can be disable at any time

M	N=0	M	N=0	M	N=0	M	N=4
02	1sec	33	50sec	B5	180sec	11	992sec
03	2sec	38	55sec	BF	190sec	22	2012sec
04	3sec	3D	60sec	C9	200sec	33	3032sec
05	4sec	42	65sec	D3	210sec	43	3992sec
06	5sec	47	70sec	DD	220sec	54	5012sec
07	6sec	4C	75sec	E7	230sec	65	6032sec
08	7sec	51	80sec	F1	240sec	75	6992sec
09	8sec	56	85sec	FB	250sec	86	8012sec
M	**N=0**	**M**	**N=0**	**M**	**N=4**	**M**	**N=4**
0B	10sec	65	100sec	05	272sec	97	9032sec
10	15sec	6F	110sec	06	332sec	A7	9992sec
15	20sec	79	120sec	07	392sec	B8	11012sec
1A	25sec	83	130sec	08	452sec	C9	12032sec
1F	30sec	8D	140sec	09	512sec	D9	12992sec
24	35sec	97	150sec	0A	572sec	EA	14012sec
29	40sec	A1	160sec	0B	632sec	FB	15032sec
2E	45sec	AB	170sec	0C	692sec		

MEMO